

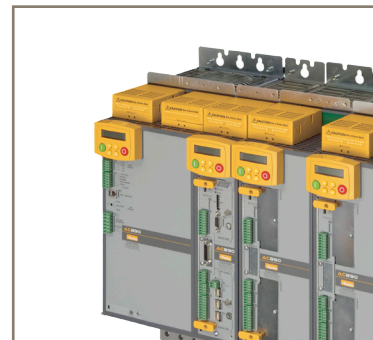


aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



AC890 Variable Speed Drive

High performance closed-loop control of induction and permanent magnet motors for process applications
0.55 kW - 315 kW Performance Drive



ENGINEERING YOUR SUCCESS.



WARNING – USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

- This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.
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Features	6
AC890CS Common DC Bus Power Supply.....	9
AC890CD Series Common DC Bus Variable Speed Drive..	10
AC890SD Series Standalone Variable Speed Drive	11
Electrical Characteristics	11
Standards and Conformance	13
Dimensions	14
Connections	15
Power connections – Common DC Bus.....	15
Power connections – Standalone Drive	16
AC890CS DC Power Supply Module.....	17
Accessories and Options	19
Communication Interfaces	19
Feedback Cards	20
Input and Output Cards.....	22
Drive System Explorer (DSE) Software.....	23
Order Code.....	24
AC890CS – Common Bus Power Supply.....	24
AC890CA – Common Bus Adapter	24
AC890CD – Common Bus Drive	25
AC890SD – Stand Alone Drive.....	26

Parker Hannifin

The global leader in motion and control technologies

Global Product Design

Parker Hannifin has more than 40 years experience in the design and manufacturing of drives, controls, motors and mechanical products. With dedicated global product development teams, Parker draws on industry-leading technological leadership and experience from engineering teams in Europe, North America and Asia.

Local Application Expertise

Parker has local engineering resources committed to adapting and applying our current products and technologies to best fit our customers' needs.

Manufacturing to Meet Our Customers' Needs

Parker is committed to meeting the increasing service demands that our customers require to succeed in the global industrial market. Parker's manufacturing teams seek continuous improvement through the implementation of lean manufacturing methods throughout the process. We measure ourselves on meeting our customers' expectations of quality and delivery, not just our own. In order to meet these expectations, Parker operates and continues to invest in our manufacturing facilities in Europe, North America and Asia.

Electromechanical Worldwide Manufacturing Locations

Europe

Littlehampton, United Kingdom
Dijon, France
Offenburg, Germany
Filderstadt, Germany
Milan, Italy

Asia

Wuxi, China
Jangan, Korea
Chennai, India

North America

Rohnert Park, California
Irwin, Pennsylvania
Charlotte, North Carolina
New Ulm, Minnesota



Offenburg, Germany

Local Manufacturing and Support in Europe

Parker provides sales assistance and local technical support through a network of dedicated sales teams and authorized technical distributors throughout Europe.

For contact information, please refer to the Sales Offices on the back cover of this document or visit www.parker.com



Milan, Italy



Littlehampton, UK



Filderstadt, Germany



Dijon, France

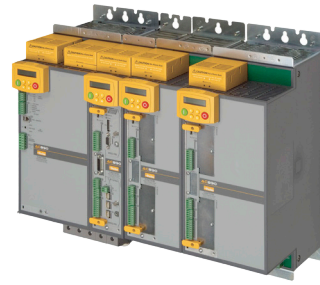
High Performance Modular Systems Drive - AC890 Series

Description

The AC890 is a compact, high performance AC drive engineered to control speed and position of open- and closed-loop, single- or multi-motor AC induction or brushless servo motor applications.

Available as a standalone drive with AC input and direct connection to a motor, or as a common bus drive supplied via the DC bus connections, AC890 can be configured to provide control in four different modes of operation.

- Open-loop (volts / frequency) control**
 ideal for simple, single or multi-motor speed control.
- Sensorless vector control**
 A high performance sensorless vector algorithm delivering a combination of high torque and close speed regulation without the need for a speed sensor.
- Closed-loop vector control**
 Full closed-loop flux vector control can be achieved by simply adding an encoder feedback option module. This provides 100 % continuous full load standstill torque and a highly dynamic speed loop to suit even the most demanding applications.
- 4 Quadrant Active Front End (AFE)**
 AC890 can be used to feed regenerative energy back on to the mains supply in line with unity power factor and in line with international harmonic limits.



Parker MR Series Motor



PMAC Brushless Motors



Torque motors

Technical Specification - overview

Power Supply	890CS: 208-500 VAC ±10% 890CD: 320/560-705 VDC 890SD: 380-500 VAC ±10% Frames E/F/G/H/J: 380-460 VAC ±10%
Environment	0 ... 45 °C (derate by 2 %/ °C up to 50 °C maximum) Max. 1000 m ASL (derate by 1 %/100 m to 2000 m)
Protection	IP20 (Frames G/H/J: IP00)
Humidity	Maximum 85 % Non-Condensing
Analogue Inputs	4; Configurable 2 x 0-10 V, ±10 V, 0-20 mA, 4-20 mA and 2 x 0-10 V, ±10 V
Analogue Outputs	2; Configurable 0-10 V, +/- 10 V
Digital Inputs	7; Configurable 24 VDC
Digital Output	2; Configurable 24 VDC
Digital Relay Output	1; Configurable
Communications Options	EtherNet/IP, Modbus/TCP, CANopen, PROFIBUS, PROFINET, DeviceNet, ControlNet, FireWire, EtherCAT, Peer to Peer, RS458/Modbus, LINKnet
Axis Synchronisation	Internally via Firewire
Registration Control Options	Mark Registration (EnDat 2.1 Encoder)

Features

Range of feedback options

- Incremental encoder
- EnDat® 2.1 (SinCos) encoder
- Resolver

Open FireWire IEEE 1394 Process Port

- 125 µs cycle time
- Real-time synchronization between drives



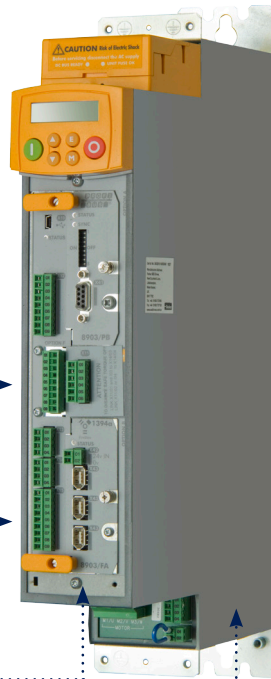
Open communication



Ultra-fast control loops

- Torque loop: 62.5 µs
- Speed loop: 62.5 µs
- Position loop: 62.5 µs

* stand alone version shown



Serves the most demanding applications

Taking advantage of leading edge control algorithms running on a fast 150 MHz microprocessor, the AC890 drive can achieve very high-bandwidth control loops. This allows you to use the drive for the most demanding industrial applications e.g. printing, cut-to-length, rotary shear, converting and slitting.

Benefits

► Integrated safety functionality

The integrated Safe Torque Off (STO) functionality offers protection against unexpected motor start-up, in accordance to EN 13849-1 PL-e, or SIL 3 to EN61800-5-2.

► Minimal delay between fieldbus setpoints and the control loops

Designed to integrate in existing automation systems, the AC890 features high performance ports linked directly to the fast control loops of the drive.

Minimum delay exists between your digital setpoint sent through a fieldbus and the control loops.

► Replacement of analogue solutions

Your existing analogue setpoint-based solutions can be replaced by a digital fieldbus-based solution with minimal bandwidth loss.

► Flexible feedback options

The AC890 offers system designers complete flexibility in their choice of feedback technology to best suit the needs of their application.

► Open standards for protection of investment

The AC890 has been specifically designed to integrate seamlessly into your automation network.

To connect to your PLC or fieldbus network you can simply choose from the wide range of communication technology boxes.

The Ability to Perform

AC890 offers advanced performance levels with configurable functionality in the form of application specific function blocks.

This allows you to match the performance of your drive to the specific needs of your application.

Advanced Performance

- Motion control with position control
- Motion control function blocks: incremental move, absolute move, move home
- Section control function blocks: Line drive master ramp, winder blocks (speed and current winder), PID process, sequencer.

- Library of pre-engineered application specific LINK VM function blocks such as: Shaftless printing, cut-to-length, advanced winding, advanced traversing.

Space saving compact footprint thanks to modular design concept

Stand Alone version



The Complete Drive

The AC890SD series Stand Alone drive provides a complete AC input to AC motor output, with power input and output terminals.

Other characteristics of the AC890SD include:

- Power output up to 315 kW
- 208...500 VAC input supply
- Access to all feedback and networking options
- Built-in dynamic brake switch provisions to add external braking resistor
- 24 VDC control board supply for programming without power
- Torque and speed outputs
- USB programming port

Common Bus version



Common Bus Drive

The AC890 is also available in a common bus platform, where individual motor output drives are easily connected to a common bus supply.

Characteristics of the common bus drive (AC890CD):

- Power output to 90 kW in 5 frame sizes
- Power Supply: 320...705 VDC
- Access to all feedback and networking options
- 24 VDC control board supply for programming without power
- Torque and speed analogue outputs
- USB programming port

Characteristics of the common bus supply module (AC890CS):

- Power output 7.5...110 kW
- Power Supply: 208...500 VAC
- Built-in dynamic braking unit (external braking resistor required)
- Operator display for diagnostics
- Up to 162 A output per module

Removable terminal block connections for easier installation and maintenance



Reduced dimensions, compact footprint

The AC890 has been designed to be compact and require the minimum possible cabinet space. Boasting the latest innovations in semiconductor cooling the AC890 is a class leader in terms of its size.

The control terminals are pluggable, simplifying connection to the drive during installation and allowing a fast swap-out for maintenance purposes.

The Common DC bus also helps to keep the overall size of the system to a minimum. Simply open the bus terminal cover, connect the busbars and close.

Fast connection of the common DC bus



Alternative Input Power Configurations

The modular design of AC890 makes it easy to connect parallel input modules and multi-phase configurations. By using 12- or 18-pulse configurations, harmful line harmonics can be greatly reduced. For the ultimate in harmonic abatement, an active front end (AFE) may be selected.

4 Quadrant active front-end power supply with regeneration to the supply network

In systems where frequent braking and starting is common in everyday operation it is possible to use AC890 to recover the braking energy of a load moving faster than the designated motor speed (an overhauling load) and return it to the mains supply.

Typically applications that could benefit from a regenerative system include feed conveyors, cranes, winches or process machinery.

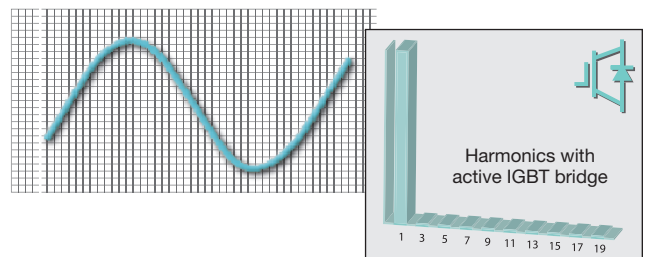
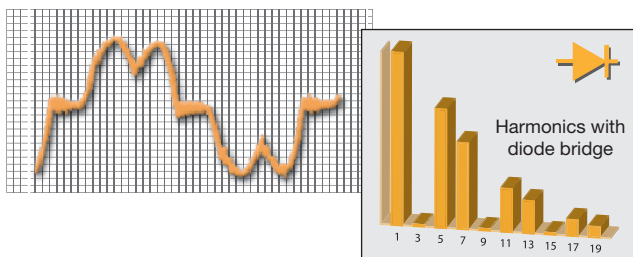
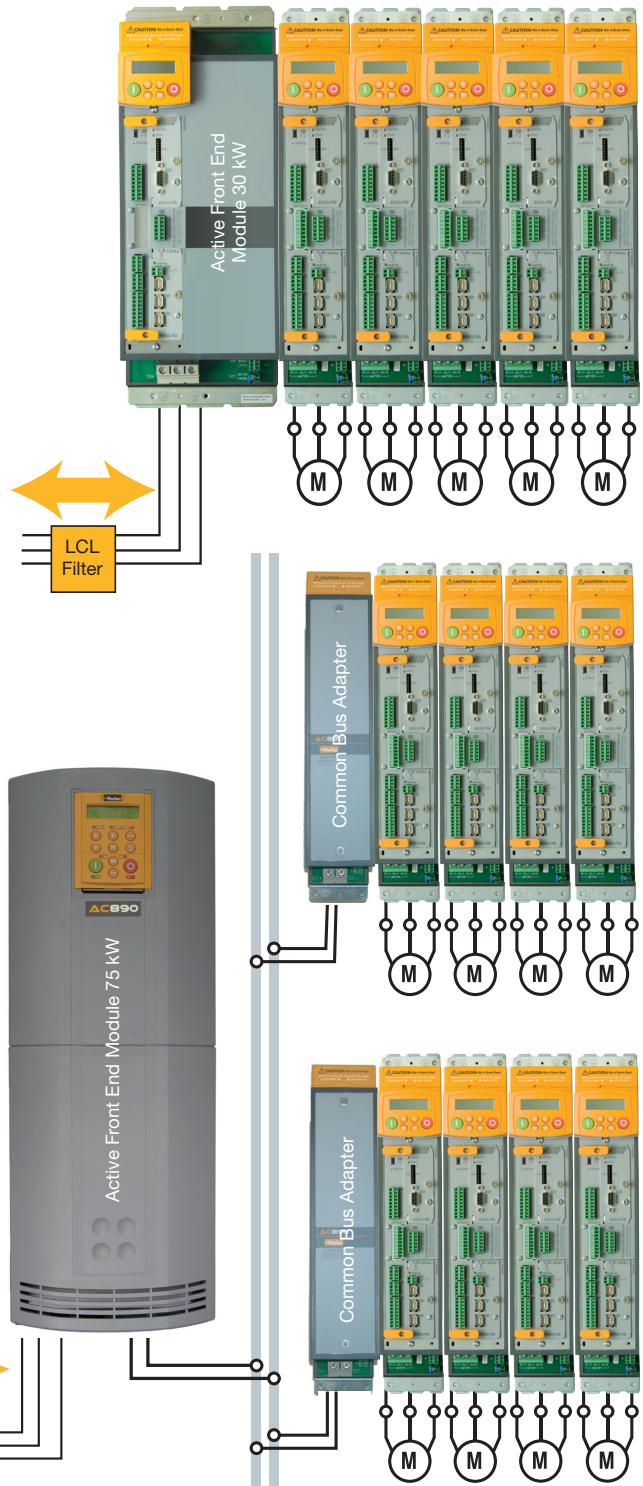
Additional components are required to implement an active front-end system.

Benefits of an Active Front-End Regenerative System

- Fully bi-directional power flow
- 150 % overload for 60s
- Sinusoidal input current
- Harmonic levels in line with international requirements

Common Bus Adaptor

For higher power systems it is possible to use a larger standalone AC890 Active Front End module. In this case rows of AC890CD drives can be connected via their DC bus connections to the AFE using a Common Bus Adaptor (AC890CA)



For alternative input power configurations, please contact your local sales office

AC890CS Common DC Bus Power Supply

7.5 kW - 110 kW

Description

The AC890CS power supply module is able to provide dual output voltages to power one or more common bus AC890CD, or stand-alone AC890SD drives connected in a common DC bus configuration. This modularity delivers significant space saving in the electrical enclosure.

Features

- 208 – 500 VAC supply voltage
- 7.5 kW – 110 kW Power output
- Built-in dynamic braking unit
- Dual DC bus power output terminals
- Operator display for diagnostics



Electrical Characteristics

Order code	Power [kW]	Input voltage [VAC]	Frame	AC input current [A]	DC output current [A]	
890CS-532320B0-000-U	7.5	230	B	32	40	
	15	400 / 460				
	18	500				
890CS-532540B0-000-U	15	230		D	54	65
	30	400 / 460				
	37	500				
890CS-533108D0-000-U	30	230	D		108	135
	60	400 / 460				
	75	500				
890CS-533162D0-000-U	45	230		D	162	200
	90	400 / 460				
	110	500				

Note: For increased power, additional units can be connected in parallel. For further details, contact our technical support department.

AC890CD Series Common DC Bus Variable Speed Drive

0.55 kW - 90 kW

Description

Available in 3 power supply versions, the AC890CD common DC bus variable speed drive is designed to be fed via its common DC bus in conjunction with either an AC890CS power supply module or an AC890CA common bus adapter.

Features

- 320, 650, 705 V DC supply voltage
- Power output to 90 kW
- Suitable for use with all common AC890 Series feedback and communications options
- USB programming port



Electrical Characteristics

Order code	Power [kW]	Input voltage [VDC]	Frame	DC input current [A]	Output current [A]	
					Vector mode	Servo mode
890CD-231700B0-000-...	1.5	320	B	9.3	7	6
890CD-232165B0-000-...	4			22.2	16.5	12
890CD-531200B0-000-...	0.55			2.9	2	1.5
890CD-531350B0-000-...	1.1			5	3.5	2.5
890CD-531450B0-000-...	1.5			6.6	4.5	3.5
890CD-531600B0-000-...	2.2			8.6	6	4
890CD-532100B0-000-...	4			14.1	10	6
890CD-532120B0-000-...	5.5			16.8	12	9
890CD-532160B0-000-...	7.5			22.2	16	12
890CD-232300C0-000-...	7.5	320	C	39	30	30
890CD-532240C...	11	560		33	24	20
890CD-532300C...	15			43	30	25
890CD-532450D0-000-...	22	560	D	51	45	38
890CD-532590D0-000-...	30			66	59	50
890CD-432730E0-0...	37	560	E	82	73	73
890CD-432870E0-0...	45			100	87	87
890CD-532730E0-0...	37	705		66	67	67
890CD-532870E0-0...	45			80	79	79
890CD-433145F...	75	560	F	166	145	110
890CD-433156F...	90			203	180	135
890CD-533105F...	55	705		98	100	74
890CD-533145F...	75			133	125	95
890CD-533156F...	90			162	156	117

Note: For higher powers, refer to AC890SD series supplied from a DC bus.

AC890SD Series Standalone Variable Speed Drive

0.55 kW - 315 kW

Description

AC890SD standalone drives are independent modules with integrated three-phase supply inputs. With a wide range of sizes available, the AC890SD is suitable for every type of application from a small machine to a large industrial high power process line (eg. rolling mill). It is also ideally suited to sectional control such as that found in printing systems.

Features

- Directly supplied AC or DC common bus
- Built-in dynamic braking module
- Suitable for use with all common AC890 Series feedback and communications options
- USB programming port



Electrical Characteristics

Electrical Characteristics – 230V single phase drive

Order code	Power [kW]	Input voltage [VAC]	Frame	Input current [A]		Output current [A]	
				Vector mode	Servo mode	Vector mode	Servo mode
890SD-231700B0-B00-...	1.5	230	B	10.1	9.9	7	6
890SD-232165B0-B00-...	4			21.8	18.2	16.5	12
890SD-232240C0-B00-...	5.5		C	31	31	24	24
890SD-232300C0-B00-...	7.5			40	40	30	30

Note: Power ratings are given for 230 VAC

Permitted overload: 150 % for 60 s in vector mode - 200 % for 4 s in servo mode.

Electrical Characteristics – three phase drives

Order code	Power [kW]	Input voltage [VAC]	Frame	Input current [A]		Output current [A]	
				Vector mode	Servo mode	Vector mode	Servo mode
890SD-531450B0-B00-...	1.5	380-500	B	6.8	6.4	4.5	3.5
890SD-531600B0-B00-...	2.2			9	7.2	6	4
890SD-532100B0-B00-...	4			14	9,7	10	6
890SD-532120B0-B00-...	5.5			16.5	13.8	12	9
890SD-532160B0-B00-...	7.5			21.7	17.9	16	12
890SD-532240C0-B00-...	11	380-500	C	32	32	24	20
890SD-532300C0-B00-...	15			40	40	30	25
890SD-532450D0-B00-...	22	380-500	D	50	45	45	38
890SD-532590D0-B00-...	30			62	54	59	50
890SD-432730E0-0...	37	380-460	E	81	81	73	73
890SD-432870E0-0...	45			95	95	87	87
890SD-433105F...	55	380-460	F	114	114	105	78
890SD-433145F...	75			143	143	145	110
890SD-433156F...	90			164	164	180	135
890SD-433216G...	110	380-460	G	216	216*	216	153
890SD-433250G...	132			246	246	250	171
890SD-433316G...	160			305	305	316	224
890SD-433361G...	180			336	336	361	253
890SD-433375H...	200	380-460	H	367	367	375	268
890SD-433420H...	220			400	400	420	300
890SD-433480H...	250			466	466	480	336
890SD-433520H...	280			516	516	520	368
890SD-433590J...	315	380-460	J	576	576	590	411
890SD-532730E0-0...	37	380-500	E	69	69	67	67
890SD-532870E0-0...	45			82	82	79	79
890SD-533105F...	55	380-500	F	93	93	100	74
890SD-533145F...	75			118	118	125	95
890SD-533156F...	90			140	140	156	117

Permitted overload:

150 % for 60 s in vector mode

200 % for 4 s in servo mode (Frames B, C, D)

150 % for 60 s in servo mode (Frames E, F, G, H, J)

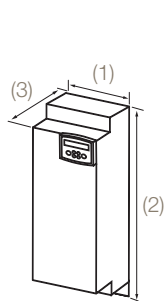
Electrical Characteristics

Operating Temperature	0 °C to +45 °C	
Storage Temperature	-25 °C to +55 °C	
Shipping Temperature	-25 °C to +70 °C	
Product Enclosure Rating	IP20 - UL (c-UL) Open Type (North America/Canada) Type 1 Suitable for cubicle mount only	
Cubicle Installation	The 890 must be installed to EN60204 Standard in the cubicle. For USA, the cubicle shall meet the requirements of UL50.	
Cubical Rating	Cubicle to provide the following attenuation to radiated emissions:	
	EMC Enclosure Standard	Attenuation to RF in spectrum 30...1000 MHz
	EN61800-3 Category C3	None
	EN61800-3 Category C1 Restricted Distribution EN61000-6-3	10 db
	EN61800-3 Category C1 Unrestricted Distribution EN61000-6-4	20 db
Humidity	Maximum 85 % relative humidity at 40 °C (104 °F) non-condensing	
Altitude	If greater than 1000 m above sea level, derate by 1 % per 100 m to a maximum of 2000 m	
Atmosphere	Non flammable, non corrosive and dust free	
Climatic Conditions	Class 3k3, as defined by EN50178	
Vibration	The product has been tested to the following specification: Test Fc of EN60068-2-6 10 Hz<=f<=57 Hz sinusoidal 0.075 mm amplitude 57 Hz<=f<=150 Hz sinusoidal 1 g 10 sweep cycles per axis on each of three mutually perpendicular axis	

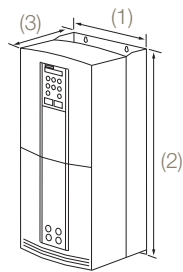
Standards and Conformance

Pollution Degree	Pollution Degree II (non-conductive pollution, except for temporary condensation)
Europe	When fitted inside an enclosure, this product conforms with the Low Voltage Directive 2006/95/EC using EN50178 to show compliance.
North America / Canada	Complies with the requirements of UL508C as an open-type drive.
Conformal Coated Product	Conformal coating increases the product's resistance to certain climatic conditions. Note: conformal coating, where effective, will only mitigate the effects being considered.
EMC Compatibility (EMC Directive)	CE Marked in accordance with 2004/108/EC

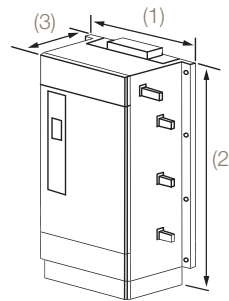
Dimensions



Frames B/C/D



Frames E/F



Frames G/H/J

Dimensions and Weights

Model	Width (1) [mm]	Height (2) [mm]	Depth (3) [mm]	Weight [kg]			
				890CS	890CD	890SD	
890 Frame B	72.4	433	258	3.5	5	6	
890 Frame C	116			Data not available	6.6	7.6	
890 Frame D	160			8.7	12.1	13.1	
890 Frame E	257	668	312	Data not available	32.5	33.5	
890 Frame F		720	355		41	42	
890 Frame G	456	1042	465		Data not available	Data not available	108
890 Frame H	572	1177					138
890 Frame J	675	1288					176

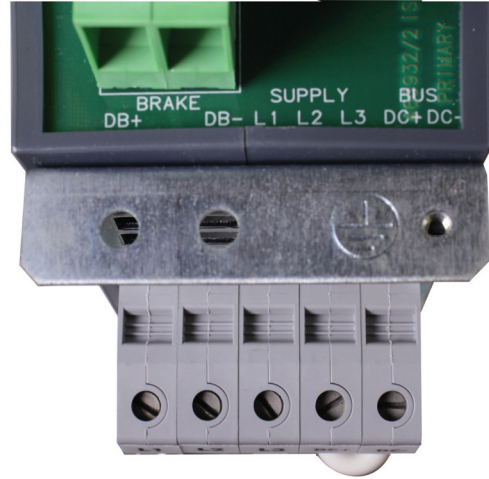
Connections

Power connections – Common DC Bus

AC890CS Common Bus Supply

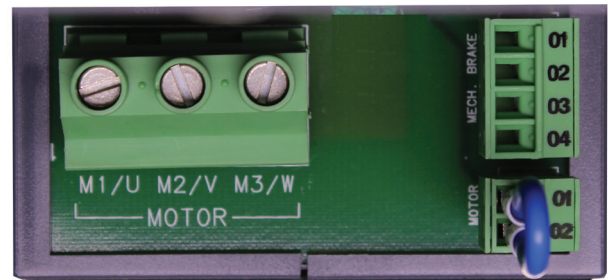
Terminal	Description
L1	L1 AC Input Supply
L2	L2 AC Input Supply
L3	L3 AC Input Supply
¹ DC+ Bottom Terminal	DC Link Bus +Ve
¹ DC- Bottom Terminal	DC Link Bus -Ve
DBR+	Dynamic Brake Resistor
DBR-	Dynamic Brake Resistor

¹ A factory fitted safety bung is fitted to DC+ and DC- terminals which maintain the IP20 Rating. Leave this bung in place if using the DC bus connections on the top of the unit



AC890CD Common Bus Drive

Terminal	Description
M1/U	Motor Output 1/U
M2/U	Motor Output 2/U
M3/W	Motor Output 3/W
Motor Thermistor 1	PTC Type 'A' Thermistor
Motor Thermistor 2	PTC Type 'A' Thermistor
Mechanical Brake 1	0V Brake Supply
Mechanical Brake 2	24V Brake Supply
Mechanical Brake 3	Brake Coil -
Mechanical Brake 4	Brake Coil +



AC890CD Common Bus Drive

Terminal	Description
DC+ Top Terminal	DC Link Bus +Ve
DC- Top Terminal	DC Link Bus -Ve



Power connections – Standalone Drive

AC890SD Standalone Drive

Terminal	Description
Top Terminal Rail	
L1	L1 AC Input Supply
L2	L2 AC Input Supply
L3	L3 AC Input Supply
Brake DC+ / DBR+	Dynamic Brake Resistor
Brake EXT / DBR-	Dynamic Brake Resistor

Bottom Terminal Rail	
M1/U	Motor Output 1/U
M2/U	Motor Output 2/U
M3/W	Motor Output 3/W
DC+	DC Bus Link Monitoring
DC-	DC Bus Link Monitoring
Motor Therm. 1	PTC Type 'A' Thermistor
Motor Therm. 2	PTC Type 'A' Thermistor
Mech. Brake 1	0 V Brake Supply
Mech. Brake 2	24 V Brake Supply
Mech. Brake 3	Brake Coil -
Mech. Brake 4	Brake Coil +



AC890SD Top Power Terminals

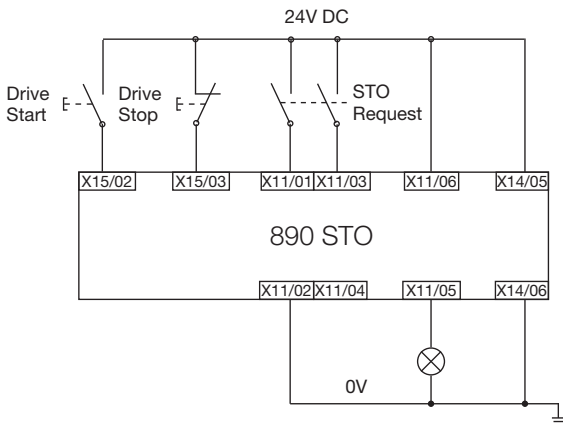


890SD Bottom Power Terminals

Safe Torque Off (STO)

AC890 features STO functionality as standard, offering users protection against unexpected motor start-up in accordance with EN 13849-1 at PLe Cat 3 or SIL 3 to EN61800-5-2.

The STO functionality helps protect personnel and machinery by preventing the drive from restarting automatically. It disables the drive pulses and inhibits the power supply to the motor, so that the drive cannot generate any potentially hazardous movement. The state is monitored internally within the drive.



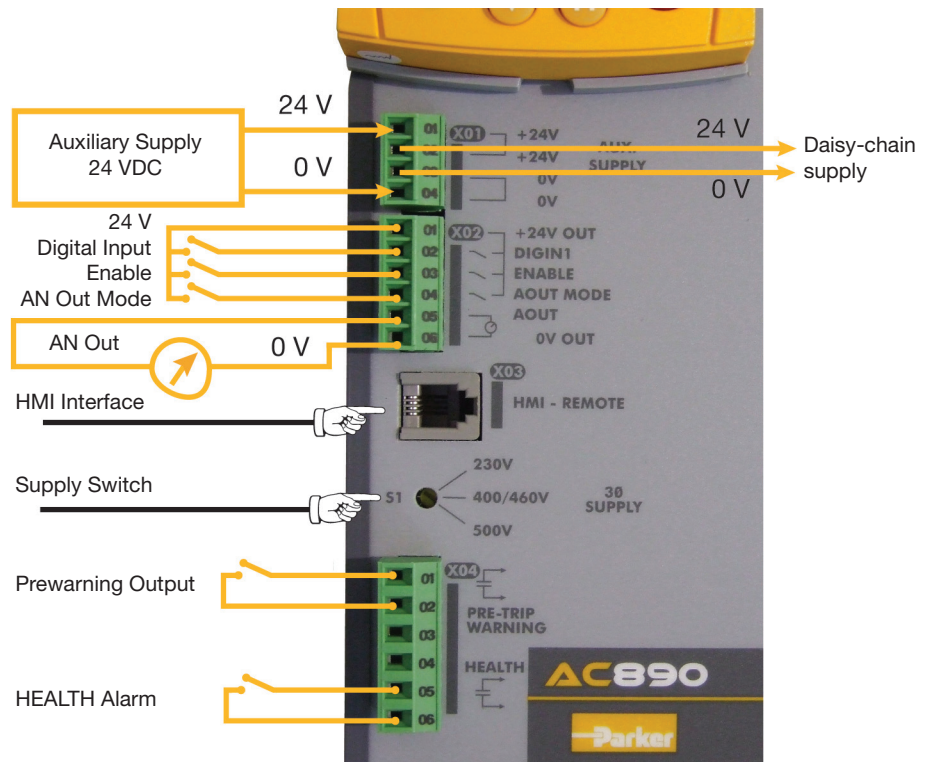
Term.	Description
X11/01	STO Channel A Input
X11/02	STO Common
X11/03	STO Channel B Input
X11/04	STO Common
X11/05	STO Status -Ve
X11/06	STO Status +Ve

The example wiring diagram shows the minimum connections required to implement STO with the AC890 Series of drives



It is the user's responsibility to ensure the safe and correct use of the STO functionality. Users should read and fully understand chapter 6 of the product user manual available on www.parker.com.

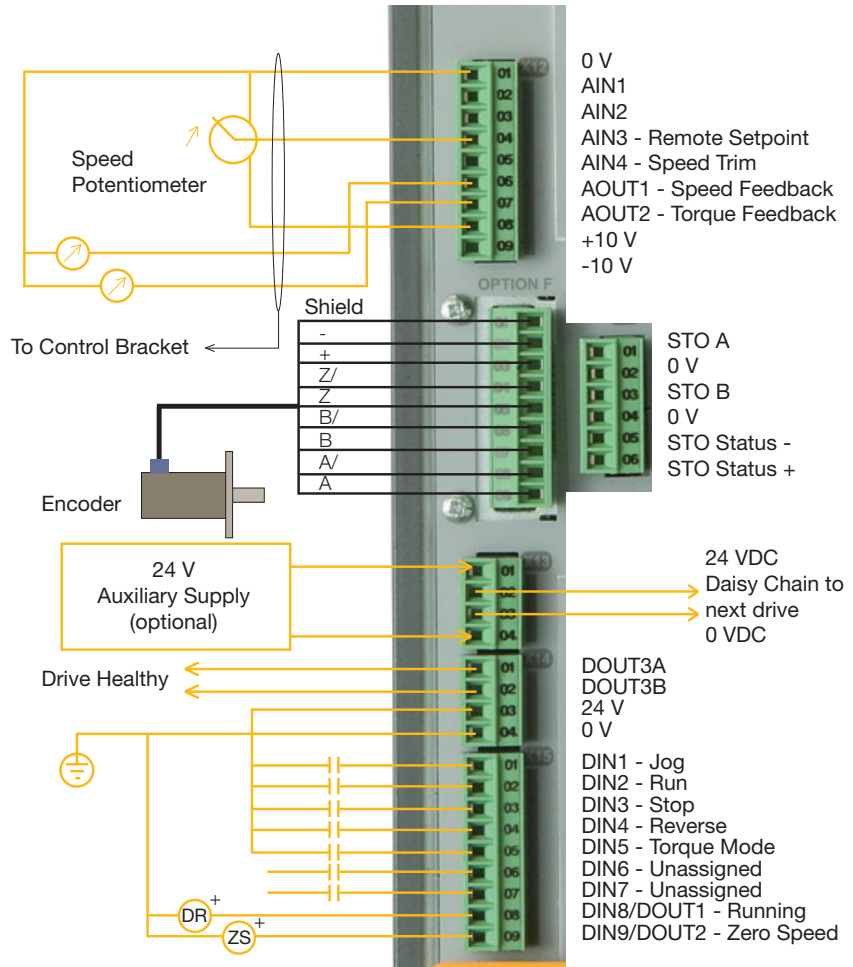
AC890CS DC Power Supply Module



Term.	Label	Description
X01/01	+24 V Aux	+24 VDC Supply
X01/02	+24 V Aux	+24 VDC Daisy chain to next drive
X01/03	0 V Aux	0 VDC Common
X01/04	0 V Aux	0 VDC Daisy chain to next drive
X02/01	+24 V Out	24 VDC supply for X02 Digital I/O
X02/02	DIGIN1	Not used
X02/03	Enable	Enable power supply module
X02/04	AOUT MODE	0V = (kW), 24 V = (A) units for AOUT
X02/05	AOUT	0...10 V meter connection.
X02/06	0 V OUT	0 V reference for AOUT
X03	HMI	Port for remote keypad
S1	3 Ø Supply	Power supply voltage selection
X04/01	Pre-Trip	Pre-Trip warning volt free contact
X04/02	Pre-Trip	Pre-Trip warning volt free contact
X04/03		Not Used
X04/04		Not Used
X04/05	Health	Drive Healthy volt free contact
X04/06	Health	Drive Healthy volt free contact

AC890CS DC Power Supply Module

For detailed AC890 Series connection information, please consult the product manual HA468445U004.



Term.	Label	Description
X12/01	0 V	0V reference for Analog I/O
X12/02	AIN1	0-10 V, ±10 V Analog Input 1
X12/03	AIN2	0-10 V, ±10 V Analog Input 2
X12/04	AIN3	±10 V, 0-10 V, 0-20 mA, 4-20 mA Analog Input 3
X12/05	AIN4	±10 V, 0-10 V, 0-20 mA, 4-20 mA Analog Input 4
X12/06	AOUT1	±10 V Analog Output 1
X12/07	AOUT2	±10 V Analog Output 2
X12/08	+10 V REF	+10 V Reference for Analog I/O
X12/09	-10 V REF	-10 V Reference for Analog I/O
X13/01	24 V Input	User +24 VDC (2 A)
X13/02	24 V Input	User +24 VDC (2 A)
X13/03	0 V Input	0 V Input
X13/04	0 V Input	0 V Input

Term.	Label	Description
X14/01	DOUT3A	Volt Free 24 V 1 A Relay Contact
X14/02	DOUT3B	Volt Free 24 V 1 A Relay Contact
X14/03	User 24 V	24 V DC Output 150 mA Load
X14/04	0 V	0 V Reference for User 24 V Output
X15/01	DIN1	24 V Digital Input 1
X15/02	DIN2	24 V Digital Input 2
X15/03	DIN3	24 V Digital Input 3
X15/04	DIN4	24 V Digital Input 4
X15/05	DIN5	24 V Digital Input 5
X15/06	DIN6	24 V Digital Input 6
X15/07	DIN7	24 V Digital Input 7
X15/08	DIN8/DOUT1	24 V Digital Input/Output 1
X15/08	DIN9/DOUT2	24 V Digital Input/Output 2

Accessories and Options

Communication Interfaces



8903-IP-00	Ethernet IP communication interface
Supported Protocols	Ethernet IP
Communication Speed	10/100 Mbits/s
Station Address	By Drive System Explorer software via RTNX protocol
Suitable for firmware	Version 3.2+

8903-IM-00	Ethernet Modbus/TCP communication interface
Supported Protocols	Modbus TCP
Communication Speed	10/100 Mbits/s
Station Address	By Drive System Explorer software via RTNX protocol
Suitable for firmware	Version 3.2+

8903-DN-00	DeviceNet communication interface
Supported Protocols	Supports the group 2 only slave subset of the DeviceNet protocol
Communication Speed	125 k, 250 k and 500 kbits/s
Station Address (MACID)	Dip switch or software setting of station address and network speed
Supported Messages	Polled I/O, Cyclic Outputs, Change of State (COS), Explicit Messaging
Suitable for firmware	Version 1.9+

8903-CB-00	CANopen communication interface
Profile	DS402
Communication Speed	20 k, 50 k, 125 k, 250 k, 500 k, 1 Mbits/s selectable by software or DIP switch setting
Station Address	DIP switch or software setting of station address and network speed
Supported Messages	SDO, PDO, NMT, SYNC
Suitable for firmware	Version 1.3+

8903-CN-00	ControlNet communication interface
Communication Speed	Selectable by software or DIP switch setting
Station Address	Software setting of station address
Supported Messages	Polled I/O
Suitable for firmware	Version 1.4+

8903-PB-00	PROFIBUS-DP communication interface
Supported Protocols	PROFIBUS-DP; Demand data and Data exchange
Communication Speed	Up to 12 Mbits/s; selected by the master
Station Address	DIP switch or software setting of station address
Suitable for firmware	Version 1.4+

8903-FA-00	Firewire IEEE 1394 communication interface
Communication Speed	Up to 400 MBaud
Communication Supported	Peer-to-peer communication between drives via IEEE 1394 standard
Suitable for firmware	Version 3.2+

8903-LN-00	LINKnet communication interface
Communication Speed	Up to 100 Mbits/s
Communication Supported	Peer-to-peer communication between drives
Suitable for firmware	Version 3.13+



Communication Interfaces

8903-PN-00	PROFINET I/O communication interface
Supported Protocols	PROFINET I/O Real-Time (RT) Protocol
Communication Speed	100 Mbits/s
Station Address	Software setting of station address via DSE
Suitable for firmware	Version 3.3+

8903-SP-00	CAN peer to peer communication interface
Supported Protocols	Peer to peer data exchange with other drives
Communication Speed	Up to 1 Mbits/s selectable by DIP switch
Station Address	Selected by DIP switch setting
Suitable for firmware	Version 3.3+

8903-CT-00	EtherCAT communication interface
Supported Protocols	CANopen over EtherCAT (CoE) DS301 compliant
Communication Speed	100 Mbits/s
Suitable for firmware	Version 3.7+

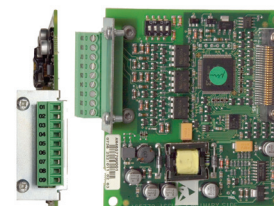
8903-RS-00	RS485 / Modbus communication interface
Supported Protocols	Modbus RTU only
Communication Speed	1200 to 115200 bits/s
Station Address	Selectable via software
Suitable for firmware	Version 3.7+



Feedback Cards

Incremental Quadrature Encoder Card 8902-EQ

8902-EQ-00-00	HTTL Incremental Encoder
Maximum pulse rate	250 kHz (differential) 200 kHz (single ended)
Receiver current	≤10 mA per channel
Input Format	Two differential channels in quadrature (Clock/direction or clock only)
Input Voltage	±30 V (differential), 0...30 V (single-ended)
Input Voltage Differential	±30 V maximum
Input Voltage Threshold dip switch settings	3 V ±1 V (differential) 8 V ±1 V (single-ended)
Encoder Power Supply	Maximum load 200 mA or 2 W

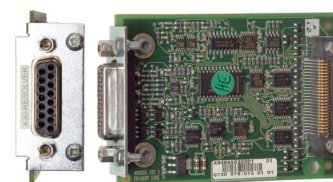


Description

The HTTL 8902-EQ speed feedback option allows incremental encoders to be connected directly to the drive to provide highly accurate speed feedback measurement. Supplies variable voltage isolated encoder power supply.

Resolver Feedback Card 8902-RE

8902-RE-00-00	Resolver feedback card
Maximum Speed	Up to 50 000 min ⁻¹ (with 2 pole resolver)
Carrier Output Signal	7 V _{rms} , 8 kHz
Maximum Carrier Supply	70 mArms
Maximum Input Voltage	±12 V _{peak}
Accuracy	<5 minutes
Resolution	Equivalent to 16 bits in one revolution of resolver
Inputs	Differential inputs Z _{in} ~2 kΩ
Maximum Input Voltage	12 V _{peak}



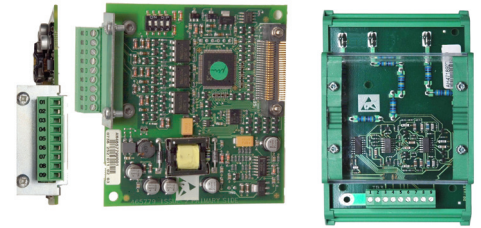
Description

The 8902-RE resolver speed feedback option allows the resolver to be connected directly to the drive to provide highly accurate speed feedback measurement. Contains a carrier output signal to power the resolver.

Feedback Cards

Line Synchronization Card 8902-LS-00-00

8902-LS-00-00	Line Synchronization card
Input Frequency	40-70 Hz
Input Voltage Range	+/-30 V (differential)
LA471892U001	Line Synchronization Attenuator
Input Voltage Range	400-690 VAC +/-10%
Output Voltage Range	+/-30 V (differential)

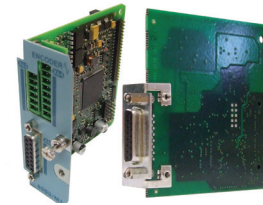


Description

The Line Synchronization card paired with the Attenuator allow the 890 Active Front-End (AFE) to monitor the three-phase supply voltage waveform and synchronize the IGBT firing to supply grid frequency and phase rotation. Once synchronized, the AFE acts as a four-quadrant, sinusoidal, power factor controlled power supply.

SinCos® registration position 8902-M1 and 8903-M1

8902-M1-00	Slave SinCos® registration
8903-M1-00	Master SinCos® registration
Maximum Pulse Rate	250 kHz
Receiver Impedance	120 Ω
Input Format	2 differential 1 V _{pp} signals in quadrature
Encoder Supply	250 mA maximum load
Supply Voltage	5 V/10 V adjustable
Terminal Type	Sub-D15 connector
Maximum Cable Length	150 m screened cable
Serial Protocol	EnDat2.1



Description

- The 8903-M1-00 and 8902-M1-00 feedback cards allow operation without external registration position, thanks to the connection of the encoder to the drive. They provide highly accurate speed feedback measurement and registration. Nevertheless registration applications are best achieved when both cards are used.
- Interpolates each encoder line with 11-bit accuracy giving 4 million counts/rev. on a 2048 line encoder
- Supplies 5 V or 10 V to the encoder
- Decodes Heidenhain EnDat2.1 absolute position encoders
- Isolated digital inputs that can be used either for general purpose inputs, or for inputs from registration mark sensor (8903-M1 only)
- 3 non-isolated digital outputs that can be either for general purpose outputs or for synthesizing an encoder output (8903-M1 only)

Approved Encoders

	1 V _{pp}	EnDat2.1	Single turn ABS	Multi-turn ABS
Heidenhain:				
ECN113	√	√		√
ECN1113	√	√	√	
EQN425	√			
ECN413				
ERN480				
Stegmann:				
HG660 AKR (xxx)S	√			
HG660 DKR (xxx)S	√			
Hengstler:				
RIS58-H				

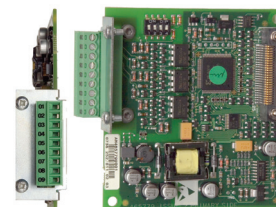
Input and Output Cards

Auxiliary digital input (8903-M1... only)

Low Logic Level	0 V to 5 V relative to X63 pin 5
High Logic Level	15 V to 26 V relative to X63 pin 5
Maximum Input Voltage	30 V relative to X63 pin 5
Input Current	Low logic level <1 mA High logic level >3 mA, <10 mA Typical input at 24 V: 7 mA
Isolation withstand relative to drive chassis	30 V
Input Safety Category	SELV
Terminal Type	6-way pluggable 3.5 mm terminal block
Maximum Cable Length	150 m screened cable is recommended for all lengths, but essential if over 30 m in order to comply with EMC regulations

Auxiliary digital outputs (8903-M1... only)

Input Voltage (VS)	5 V to 24 V
Maximum Input Voltage	30 V
Maximum Output Current	±100 mA per output
Output Voltage	Low logic level <3 V to 100 mA High logic level >VS – 4 V to 100 mA
Overload and short circuit duration	Indefinite withstand
Max. Output Frequency	250 kHz per output
Terminal Type	8-way pluggable 3.5 mm terminal block
Maximum Cable Length	150 m screened cable is recommended for all lengths, but essential if over 30 m in order to comply with EMC regulations



High Resolution Analogue Input 8903-AI and 8903-EP Encoder Card

8903-AI-00-00	High Resolution Analogue Input Card
8903-EP-00-00	Encoder Card
Maximum pulse rate	250 kHz
Receiver current	≤10 mA per channel
Input Format	Two differential channels in quadrature (Clock/direction or clock only)
Input Voltage	±30 V (differential), 0-30 V (single-ended)
Input Voltage Threshold dip switch settings	3 V ±1 V (differential) 8 V ±1 V (single-ended)
Encoder Power Supply	Maximum output current ±100 mA per output

High Resolution Analogue Input 8903-AI Only

Analogue Input	
Resolution	15 bits + sign bit
Input Voltage Range	±11 V
Input Format	Differential
Input Impedance	100 kΩ
Input Low Pass Filter	3 kHz
Encoder Power Supply	Maximum output current ±100 mA per output

Description

The high resolution Analog Input Option adds a sixth analogue input to the AC890 Modular Chassis drive. This input can be used, as the other inputs, within a configuration or directly as the speed setpoint for a fast response time.

In addition to this Analog Input the 8903/AI option provides an incremental encoder input as well as an incremental encoder output.

The 8903/EP Encoder Option has the same functionalities of the 8903/AI except for the analogue input.

Order Code

AC890CS – Common Bus Power Supply

	1		2	3		4	5		6	7		8
Order example	890CS	-	53	2320	-	B	0	-	B	00	-	U

1 Drive Type	890CS	Common Bus Power Supply
2 Voltage	53	400 / 500V Nominal
3&4 Current Rating and Frame	2320-B	32 A
	2540-B	54 A
	3108-D	108 A
	3162-D	162 A

5 Auxiliary Supply	0	None
6 Brake Switch	0	Fitted as standard
7 Special Options	00	Not Fitted
Language	U	English (50/60 Hz)

AC890CA – Common Bus Adapter

	1		2	3		4	5		6	7		8
Order example	890CA	-	53	2500	-	B	0	-	R	00	-	U

1 Product Family	890CA	Common Bus Adaptor
2 Voltage	53	400 / 500 V Nominal
3&4 Current Rating and Frame	2500-B	50 A
	2800-B	80 A

5 Auxiliary Supply	0	None
6 Hardware Characteristics	0	None
	R	Ride through capacitors (50 A Only)
7 Special Options	00	Not Fitted
8 Language	U	English (50/60 Hz)

AC890CD – Common Bus Drive

	1		2	3	4	5		6	7		8	9	10	11	12
Order example	890CD	-	23	1300	B	0	-	B	00	-	1	A	0	0	0

1	Drive Type	890CD	Common Bus Drive
2	Voltage	23	230 V Nominal
		43	400 V Nominal
		53	500 V Nominal
3 & 4	Current Rating and Frame	1700	B 1.5 kW (230 V Nominal Supply)
		2165	B 4.0 kW (230 V Nominal Supply)
		2240	C 5.5 kW (230 V Nominal Supply)
		2300	C 7.5 kW (230 V Nominal Supply)
		1450	B 1.5 kW (500 V Nominal Supply)
		1600	B 2.2 kW (500 V Nominal Supply)
		2100	B 4.0 kW (500 V Nominal Supply)
		2120	B 5.5 kW (500 V Nominal Supply)
		2160	B 7.5 kW (500 V Nominal Supply)
		2240	C 11 kW (500 V Nominal Supply)
		2300	C 15 kW (500 V Nominal Supply)
		2450	D 22 kW (500 V Nominal Supply)
		2590	D 30 kW (500 V Nominal Supply)
		2730	E 37/45 kW (400 V / 500 V Nominal Supply)
		2870	E 45/55 kW (400 V / 500 V Nominal Supply)
		3145	F 75/90 kW (400 V / 500 V Nominal Supply)
		3156	F 90/110 kW (400 V / 500 V Nominal Supply)
5	Auxiliary Supply	0	None
		1	115 V single phase (Frame F only)
		2	230 V single phase (Frame F only)

6	Brake Switch	0	Not Fitted
7	Special Options	00	Note Fitted
		07	Active Front End ('Y' caps removed Frames E & F only)
		XX	Documented special options 01-99, (contact your local sales office)
8	Performance	1	Advanced
9	Language	A	English (50 Hz / 60 Hz)
10	Option F	0	Not Fitted
11	Option A	0	Not Fitted
12	Option B	0	Not Fitted

AC890SD – Stand Alone Drive

	1		2	3	4	5		6	7		8	9	10	11	12
Order example	890SD	-	43	2730	B	0	-	B	00	-	1	A	0	0	0

1	Drive Type	890SD Standalone AC890 Drive													
2	Voltage														
	23	230 V Nominal													
	43	400 V Nominal													
	53	500 V Nominal													
3 & 4	Current Rating and Frame														
	1700	B	1.5 kW	(230 V Nominal Supply)											
	2165	B	4.0 kW	(230 V Nominal Supply)											
	2240	C	5.5 kW	(230 V Nominal Supply)											
	2300	C	7.5 kW	(230 V Nominal Supply)											
	1450	B	1.5 kW	(500 V Nominal Supply)											
	1600	B	2.2 kW	(500 V Nominal Supply)											
	2100	B	4.0 kW	(500 V Nominal Supply)											
	2120	C	5.5 kW	(500 V Nominal Supply)											
	2160	C	7.5 kW	(500 V Nominal Supply)											
	2240	C	11 kW	(500 V Nominal Supply)											
	2300	C	15 kW	(500 V Nominal Supply)											
	2450	D	22 kW	(500 V Nominal Supply)											
	2590	D	30 kW	(500 V Nominal Supply)											
	2730	E	37/45 kW	(400 V / 500 V Nominal Supply)											
	2870	E	45/55 kW	(400 V / 500 V Nominal Supply)											
	3105	F	55/75 kW	(400 V / 500 V Nominal Supply)											
	3145	F	75/90 kW	(400 V / 500 V Nominal Supply)											
	3156	F	90/110 kW	(400 V / 500 V Nominal Supply)											
	3216	G	110/132 kW	(400 V Nominal Supply)											
	3250	G	132/150 kW	(400 V Nominal Supply)											
	3316	G	160/180 kW	(400 V Nominal Supply)											
	3361	G	180/220 kW	(400 V Nominal Supply)											
	3375	H	200/250 kW	(400 V Nominal Supply)											
	3420	H	220/250 kW	(400 V Nominal Supply)											
	3480	H	250/300 kW	(400 V Nominal Supply)											
	3520	H	280/315 kW	(400 V Nominal Supply)											
	3590	J	315/355 kW	(400 V Nominal Supply)											

5	Auxiliary Supply														
	0	None													
	1	115 V single phase (Frame F - J only)													
	2	230 V single phase (Frame F - J only)													
6	Brake Switch														
	0	Not Fitted													
7	Special Options														
	00	Not Fitted													
	07	Active Front End ('Y' caps removed Frames E & F only)													
	XX	Documented special options 01-99, (contact your local sales office)													
8	Performance														
	1	Advanced													
9	Language														
	A	English (50 Hz / 60 Hz)													
10	Option F														
	0	Not Fitted													
11	Option A														
	0	Not Fitted													
12	Option B														
	0	Not Fitted													

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